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Clinical Image

Incidental Pontine Capillary Telangiectasia: A Diagnostic Pitfall on Follow-Up Neuroimaging

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Abstract

Background: Brainstem capillary telangiectasias are benign, slow-flowing vascular malformations that are usually asymptomatic and discovered incidentally on brain magnetic resonance imaging (MRI). When identified in patients with a history of cerebral venous thrombosis undergoing routine follow-up neuroimaging, they can pose a significant diagnostic challenge.

Case Presentation: We report the case of an asymptomatic 41-year-old male with a history of bilateral transverse sinus thrombosis who underwent scheduled follow-up brain MRI to evaluate the venous sinuses. Imaging confirmed sequelae of right lateral sinus wall thickening without active thrombosis. However, multiparametric brain MRI incidentally identified a distinct, peripheral, plaque-like signal anomaly in the right lateral pons. Morphological sequences demonstrated discrete hyperintensity on T2-weighted and fluid-attenuated inversion recovery (FLAIR) images. Susceptibility-weighted imaging (SWI) revealed a profound, focal hypointensity at the lesion site, corresponding to susceptibility artifacts generated by deoxygenated blood within slow-flowing capillary beds. Post-contrast T1-weighted sequences confirmed characteristic focal, stippled, "brush-like" enhancement. Arterial spin labeling (ASL) perfusion imaging showed no regional perfusion abnormalities, and no mass effect or vasogenic edema was observed.

Discussion and Conclusion: Incidental pontine capillary telangiectasias represent a critical diagnostic pitfall on follow-up neuroimaging, particularly in patients with prior dural sinus thrombosis, where they may be misdiagnosed as subacute ischemic strokes, venous congestion, demyelinating plaques, or low-grade brainstem gliomas. Familiarity with the pathognomonic multiparametric MRI findings—comprising subtle T2/FLAIR hyperintensity, "brush-like" enhancement, and prominent SWI signal drop without surrounding edema or mass effect—is essential for accurate identification. Recognizing this benign entity prevents misdiagnosis, reduces patient anxiety, and eliminates the risk of unnecessary, highly invasive brainstem biopsies.

Keywords: *Capillary Telangiectasia; Pons; Brainstem; Cerebral Venous Thrombosis; Susceptibility-Weighted Imaging (SWI); Magnetic Resonance Imaging (MRI)*

Background

Brainstem capillary telangiectasias are benign, slow-flowing vascular malformations that are usually asymptomatic and discovered incidentally on brain magnetic resonance imaging (MRI).

Clinical Image

A 41-year-old male with a history of bilateral transverse sinus thrombosis underwent a scheduled follow-up brain magnetic resonance imaging (MRI). The patient was clinically asymptomatic, and the examination was intended to monitor the evolution of the venous sinuses, which demonstrated sequelae of right lateral sinus wall thickening without active thrombosis. The brain MRI protocol was performed using a multiparametric approach including axial diffusion-weighted imaging (DWI), fluid-attenuated inversion recovery (FLAIR), Susceptibility-Weighted Imaging (SWI), 3D arterial Time-Of-Flight (TOF), and arterial spin labeling (ASL) perfusion sequences.

While no supratentorial anomalies were identified, imaging incidentally revealed a distinct right lateral-pontine signal anomaly, characterized as a peripheral, plaque-like lesion. The lesion demonstrated discrete hyperintensity on T2-weighted and FLAIR images. On Susceptibility-Weighted Imaging (SWI), the lesion exhibited a characteristic, profound hypointensity reflecting susceptibility effects from deoxygenated blood within slow-flowing capillary beds. Post-gadolinium T1-weighted sequences confirmed a focal, stippled, or "brush-like" enhancement without associated mass effect, surrounding edema, or regional perfusion abnormalities on ASL.

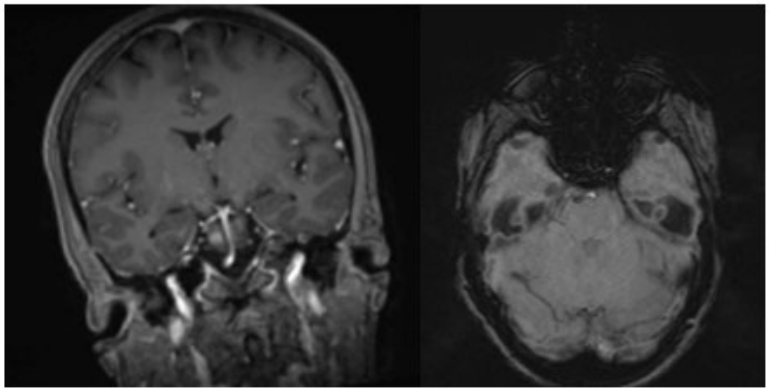


Figure 1: *Contrast-enhanced and SWI MR images showing the right pontine lesion. (A) Coronal T1-weighted post-contrast image demonstrating a characteristic "brush-like" enhancement in the right lateral pons. (B) Axial SWI sequence revealing a prominent focal hypointensity at the same site, reflecting susceptibility effects from slow-flowing venous blood.*

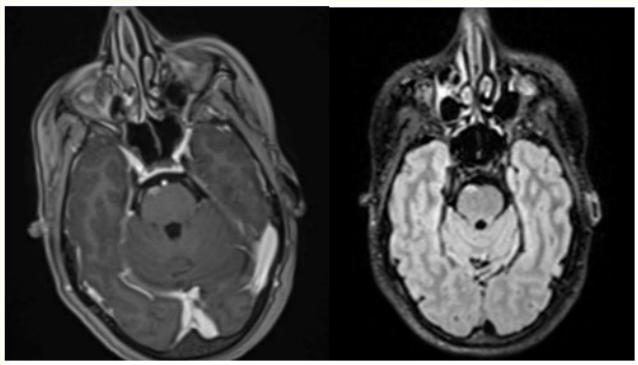


Figure 2: *Morphological MRI sequences. (A) Axial T1-weighted post-contrast image confirming the focal, peripheral enhancement. (B) Axial FLAIR sequence displaying a discrete, plaque-like hyperintensity in the right lateral pontine region without surrounding mass effect or vasogenic edema.*

Discussion

Capillary telangiectasias of the pons are benign vascular malformations that are typically quiescent. When discovered incidentally on follow-up neuroimaging—particularly in patients with a history of dural sinus thrombosis—they represent a major diagnostic pitfall [1,2]. They can be misidentified as subacute ischemic strokes, venous congestion, active demyelinating plaques, or low-grade brainstem gliomas. Recognizing this pathognomonic multiparametric MRI pattern—discrete T2/FLAIR hyperintensity, "brush-like" contrast enhancement, and strong SWI signal loss in the absence of mass effect [3]—is crucial for radiologists and clinicians to avoid erroneous diagnoses, severe patient anxiety, and highly invasive, unnecessary brainstem biopsies.

Conclusion

Pontine capillary telangiectasias are benign, usually quiescent vascular lesions that may be incidentally discovered on follow-up neuroimaging. In patients with a clinical history of cerebral venous thrombosis, these lesions can mimic acute or subacute pathology, including venous infarction, active demyelination, or brainstem neoplasm. Multiparametric MRI, incorporating SWI and post-contrast T1-weighted sequences, plays a pivotal role in establishing the diagnosis by demonstrating profound susceptibility effects and classic "brush-like" enhancement in the absence of mass effect, vasogenic edema, or perfusion alterations. A precise radiological identification of this benign condition is crucial to avoid unnecessary workups, patient distress, and risky invasive brainstem interventions.

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